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MEMORANDUM

DATE 14 January 1999

TO David Bennett, WAM, U.S. EPA, Region X

FROM: Michelle Turner, Chemist, WESTON, Seattle
rm Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Polychlorinated Biphenyls (Aroclor) Data
Laboratory Batch: K9805842
Site: Duwamish River

WORK ASSIGNMENT NO 46-23-0JZZ

WORK ORDER NO. 4000-019-038-5200-00

DOC CONTROL NO.: 4000-019-038-AAAK

cc Bruce Woods, RAP-WAM, U.S. EPA, Region X
Dena Hughes, Site Manager, WESTON, Seattle (memo only)
Kevin Mundell-Jackson, Database Management, WESTON, Seattle

The quality assurance review of twenty sediment samples, laboratory batch K9805842, collected from the Duwamish River has been completed. Samples were analyzed for polychlorinated biphenyls as Aroclors using EPA Method 8082 by Columbia Analytical Services of Kelso, Washington. The samples were numbered

98354060	98354061	98354062	98354063	98354064
98354065	98354066	98354067	98354068	98354069
98354070	98354071	98354072	98354073	98354074
98354082	98354083	98354084	98354085	98354086

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review

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DCN 4000-019-038-AAAK

14 January 1999
Region X





QA Review Batch K9805842 (PCB Aroclors)

Site. Duwamish River

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follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1-05, February 1994).

1 Timeliness

All samples were extracted 15 to 19 days after sample collection, exceeding the 14 day holding time criteria in the Sampling and Analysis Plan. However, prior to extraction, samples were stored frozen, thus extending the holding time. Samples were extracted within the 12 month holding time recommended by PSEP for frozen samples.

2 Initial Calibration

a) Mixed Aroclor 1016/1260 Standard

A six point initial calibration was performed. Calibration factors were calculated for a minimum of five peaks, none of which are common to both Aroclors. The calibration factor percent relative standard deviation (%RSD) was less than 20 percent for all peaks used for quantitation.

b) Individual Aroclor Standards

Calibration factors were calculated from a mid-range standard for the other 5 Aroclors using 3 to 5 peaks.

3. Calibration Verification

Aroclor 1016/1260 calibration verification standards were analyzed every 12 hours using a midrange standard. The calibration factor percent difference was less than 25 percent of the initial calibration value.

4. Retention Time Windows

Retention Time Windows were calculated from initial calibration. Retention times for calibration verification standards were within established windows.

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5. Detection Limits

Instrument detection limits met project required quantitation limits

6 Blanks

a) Laboratory Method Blanks

Laboratory method blank frequency criteria were met

No target analytes were reported in laboratory method blanks.

b) Field Blanks

No field blanks were associated with this laboratory batch.

7 System Monitoring Compounds (Surrogates)

Surrogate compound percent recovery met quality control criteria for all samples.

8 Matrix Spike and Matrix Spike Duplicate

All matrix spike (MS), matrix spike duplicate (MSD) and relative percent difference (RPD) results were within QC limits.

9. Laboratory Control Sample (LCS) Analysis

LCS recovery goals for Aroclors were established in the project Sampling and Analysis Plan at 70 to 130% for sediment. Based on conversations with the laboratory, historical control chart limits of 26 – 142 for Aroclor 1016 and 40-139 for Aroclor 1260 were also used for data qualification.

LCS percent recoveries met QC guidelines with the following exceptions:



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Sample	Compound	% Recovery	Associated Samples
K980911-LCS	Aroclor 1016	63	98354060 through 98354071 98354073 98354074 98354082 through 98354086

Results and quantitation limits for samples listed above were qualified as estimated (J/UJ).

10. Field Duplicate Analysis

No field duplicates were associated with this SDG.

11. Second Column Confirmation

The Relative Percent Difference (RPD) in reported analyte concentration was less than 35 percent for the primary and confirmation column for all samples except

Sample Number	Compound	DB-5 Conc	DB-608 Conc	% Diff
98354061	Aroclor 1260	20.1	28.6	35
98354066	Aroclor 1254	51.4	79.7	43
98354070	Aroclor 1260	81.8	152.2	60
98354082	Aroclor 1242	52.6	25.5	70
98354084	Aroclor 1242	40.8	24.2	51

Differences can arise from analytical interferences on one column. However, the percent differences are not deemed significant at the reported concentrations. The lower concentration was reported for each analyte.

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12 Sample Analysis

A cursory review of raw data was performed. All laboratory deliverables were present and complete. A duplicate analysis was performed on 98354055; all RPDs were less than 35 percent. An additional duplicate analysis was performed on Batch QC sample K9805598-001, the RPD for Aroclor 1254 was 43 percent and the RPD for Aroclor 1260 was 48 percent. As this sample was batch QC and may not necessarily represent sample matrix from this SDG, no qualifiers were assigned to data based on duplicate results. No complications were noted in the case narrative.

13 Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

- U - The compound was analyzed for, but was not detected.
- UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than CRDL or lowest calibration standard.
- R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
- N - Presumptive evidence of presence of material (tentative identification)
- I - Elevated reporting limit due to matrix interference

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/26/98
Date Received: 8/27/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354060 Units ug/Kg (ppb)
Lab Code K9805842-001 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	34	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	24	

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10/21/98

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Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

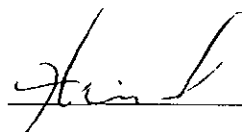
Service Request: K9805842
Date Collected: 8/26/98
Date Received: 8/27/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354061 **Units** ug/Kg (ppb)
Lab Code K9805842-002 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	uJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	33	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	20	

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Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

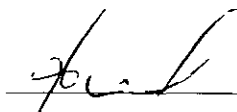
Service Request: K9805842
Date Collected: 8/26/98
Date Received: 8/27/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354062 Units ug/Kg (ppb)
Lab Code K9805842-003 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	48	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	32	

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Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/26/98
Date Received: 8/27/98

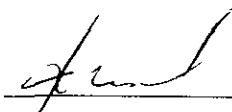
Polychlorinated Biphenyls (PCBs)

Sample Name 98354063
Lab Code K9805842-004
Test Notes

Units ug/Kg (ppb)
Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	41	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	34	

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Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

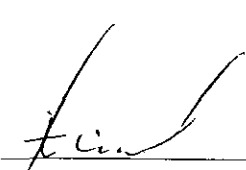
Polychlorinated Biphenyls (PCBs)

Sample Name 98354064
Lab Code K9805842-010
Test Notes

Units ug/Kg (ppb)
Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	UJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	488	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	167	

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Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

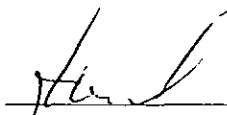
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354065 Units ug/Kg (ppb)
Lab Code K9805842-011 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	UJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	56	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	57	

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COLUMBIA ANALYTICAL SERVICES, INC

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

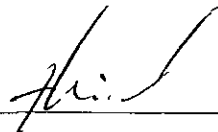
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354066 Units ug/Kg (ppb)
Lab Code K9805842-012 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	51	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	50	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

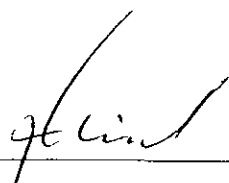
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354067 Units ug/Kg (ppb)
Lab Code K9805842-013 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	

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10/24/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354068 Units ug/Kg (ppb)
Lab Code K9805842-014 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	22	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	

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K9805842

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

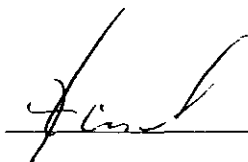
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354069 **Units** ug/Kg (ppb)
Lab Code K9805842-015 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	85	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	44	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

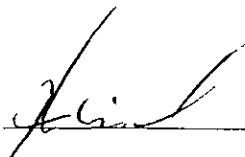
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354070 **Units** ug/Kg (ppb)
Lab Code K9805842-016 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	UJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	164	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	82	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

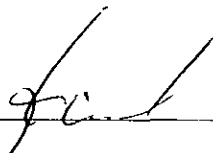
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354071 Units ug/Kg (ppb)
Lab Code K9805842-017 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	30	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	37	

Approved By



Date

10/21/98

1522/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

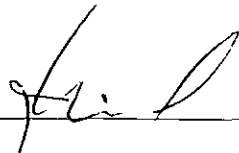
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354073 **Units** ug/Kg (ppb)
Lab Code K9805842-019 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	45	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	30	

Approved By



Date

10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

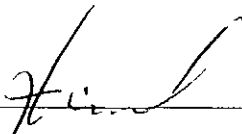
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354074 Units ug/Kg (ppb)
Lab Code K9805842-020 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	UJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	102	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	286	

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Date

10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354082 Units ug/Kg (ppb)
Lab Code K9805842-005 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	45
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	26	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	95	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	96	

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Approved By

Date

1/12/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354083 Units ug/Kg (ppb)
Lab Code K9805842-006 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	45	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	27	

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Date

10/21/98

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10/21/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

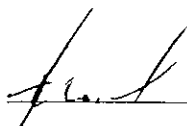
Polychlorinated Biphenyls (PCBs)

Sample Name 98354084
Lab Code K9805842-007
Test Notes

Units ug/Kg (ppb)
Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	24	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	69	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	53	

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Date 10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354085 **Units** ug/Kg (ppb)
Lab Code K9805842-008 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	40	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	24	

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Date 10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

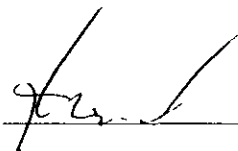
Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354086 Units ug/Kg (ppb)
Lab Code K9805842-009 Basis Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	WJ
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/18/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/18/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/18/98	67	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/18/98	57	

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Date

10/21/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: 8/27/98
Date Received: 8/28/98

Polychlorinated Biphenyls (PCBs)

Sample Name 98354072 **Units** ug/Kg (ppb)
Lab Code K9805842-018 **Basis** Dry
Test Notes

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/15/98	9/26/98	ND	
Aroclor 1221	EPA 3550B	8082	40	1	9/15/98	9/26/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/15/98	9/26/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/15/98	9/26/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/15/98	9/26/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/15/98	9/26/98	450	
Aroclor 1260	EPA 3550B	8082	20	1	9/15/98	9/26/98	728	

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Date

9/31/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F. Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9805842
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name Method Blank
Lab Code K980911-MB
Test Notes

Units ug/Kg (ppb)
Basis Dry

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1221	EPA 3550B	8082	40	1	9/11/98	10/17/98	ND	
Aroclor 1232	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1242	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1248	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1254	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	
Aroclor 1260	EPA 3550B	8082	20	1	9/11/98	10/17/98	ND	

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Date

1922/020597p